

DOCKET NO.: P05842 (NATI15-05842)
Customer No.: 23990

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : SERGEI DRIZLIKH ET AL.
U.S. Serial No. : 10/821,491
Filed : April 9, 2004
For : SYSTEM AND METHOD FOR MINIMIZING INCREASES IN VIA
RESISTANCE BY APPLYING A NITROGEN PLASMA AFTER A
TITANIUM LINER DEPOSITION
Group No. : 2812
Examiner : Lynne Ann Gurley

MAIL STOP AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

CERTIFICATE OF MAILING BY FIRST CLASS MAIL

The undersigned hereby certifies that the following documents:

1. Response to Restriction Requirement; and
2. Postcard receipt

relating to the above application, were deposited as "First Class Mail" with the United States Postal Service, addressed to, MAIL STOP AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on 4/28/05.

Date: 4/28/05

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RESPONSE TO RESTRICTION REQUIREMENT

This Response to Restriction Requirement is filed in response to the Restriction Requirement that was mailed on March 10, 2005 and the Notice of Non-Compliant Amendment that was mailed on April 21, 2005. On Monday, April 11, 2005 the Applicants mailed a Response to Restriction Requirement in which the claim status identifiers were inadvertently omitted from the claim list. Please enter the Applicants' corrected Response to Restriction Requirement as follows.

The Applicants provisionally elect the claims of Species I, Claims 1-4, with traverse.

The Restriction Requirement asserts that “This application contains claims directed to the following patentably distinct species of claimed invention: Species I – embodiment preventing a contaminant within a layer of ARC and Species II – embodiment with metal layer on substrate, applying nitrogen plasma to convert Ti to TiN layer.” (March 10, 2005 Restriction Requirement, Page 2, Lines 16-19).

The Restriction Requirement also asserts that “Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claim is generic.” (March 10, 2005 Restriction Requirement, Page 3, Lines 1-3).

In response, the Applicants provisionally elect the claims of Species I, Claims 1-4, with traverse, and provide the following list of all claims readable thereon:

1. (Original) In a semiconductor device of the type comprising a via wherein said via comprises a layer of titanium placed over a layer of anti-reflective coating (ARC) titanium nitride, a method for preventing a contaminant within said layer of anti-reflective coating (ARC) titanium nitride from combining with portions of said layer of titanium, said method comprising the steps of:
 - applying a nitrogen plasma to said layer of titanium; and
 - converting said layer of titanium to a first layer of titanium nitride;wherein said contaminant does not chemically react with said first layer of titanium nitride.

2. (Original) The method as set forth in Claim 1 wherein said contaminant within said layer of anti-reflective coating (ARC) titanium nitride is fluorine.

3. (Original) The method as set forth in Claim 2 wherein said fluorine becomes embedded in said layer of anti-reflective coating (ARC) titanium nitride during a partial etch procedure of said layer of anti-reflective coating (ARC) titanium nitride.

4. (Original) The method as set forth in Claim 1 wherein said step of applying said nitrogen plasma to said layer of titanium increases a temperature of said semiconductor device to a temperature of approximately four hundred degrees Centigrade.

The Applicants respectfully submit that the method for preventing a contaminant within a layer of anti-reflective coating (ARC) titanium nitride from combining with portions of a layer of titanium as set forth in Claims 1-4 is an integral part of the method for manufacturing a via in a semiconductor device as set forth in Claims 5-12.

The Applicants therefore respectfully submit that the claims of Species I (Claims 1-4) and the claims of Species II (Claims 5-12) are not patentably distinct and that the March 10, 2005 Restriction Requirement fails to satisfy any of the requirements for restricting the claims of the patent application. Accordingly, the Applicants respectfully request that the restriction be withdrawn.

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If any issue arises, or if the Examiner has any suggestions for expediting allowance of this application, the Applicant respectfully invites the Examiner to contact the undersigned at the telephone number indicated below or at wmunck@davismunck.com.

The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

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